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The Safe Energy Journal doesn't usually deal with the UK Government's proposed new reactor programme, although this issue includes an update. If the new reactor programme is your main interest you should watch out for our other newsletter here:
http://www.no2nuclearpower.org.uk/nuclear-news/

1 New Nuclear Update

In November 2018, the collapse of private sector support for Moorside, and in January 2019 the suspension of Wylfa, cast doubt on the future of nuclear plants in the UK. To address this, the Government consulted on a new model for funding nuclear reactors, known as a Regulated Asset Base model. The consultation closed in October 2019, but there is still no sign of a response from the Government. (1) [According to The Times, Sizewell C could cost each household (including Scotland) about £10.50 a year on their energy bills. (2)] Now Horizon Nuclear Power has stopped developing Wylfa (and Oldbury). (3)

It has been a running joke in Westminster for some time, well before the current crisis, to speculate when the much-promised Energy White Paper would finally be published. (4) It has seen numerous delays, having originally been scheduled for publication in summer 2019, it is now expected in the autumn (5) - October or November. (6)

Similarly, in December 2019, in was announced that a National Infrastructure Strategy would be published in Spring 2020 – this would encompass a formal response to the National Infrastructure Commission's detailed National Infrastructure Assessment published in 2018. (7) The Strategy has yet to appear. (8)

It's possible, therefore, that we might see all three appear in the Autumn – the Energy White Paper, the response to the RAB consultation and the National Infrastructure Strategy.

The National Infrastructure Commission has said we should order no more than one new nuclear station after Hinkley Point C. (9) Sir John Armitt, Chair of the Commission, says government policy, is 10 years old, involving a reliance on nuclear, and arguably undeliverable. It is never going to be as cheap as renewables. (10) It says the sharp fall in the cost of renewables means that Britain should aim for renewables to meet two thirds of electricity needs by 2030 and that this can be delivered at the same overall cost as meeting only half of total demand by that date. (11) Offshore wind farms auctioned last September are now expected to actually pay money back to the government over their lifetime. (12)

One of the National Grid Electricity System Operator (ESO) 2020 Future Energy Scenarios (FES) shows nuclear falling to as low as 5GW by 2050 with Hinkley Point C the only large new nuclear plant built in the UK over the next 30 years. (13)

Sizewell C

On 24 June, the UK Planning Inspectorate accepted the planning application for Sizewell C for examination. (14) The Planning Inspectorate gave people until 30th September 2020 to register as an Interested Party. (15)

Meanwhile questions are being asked about whether Sizewell C (SZC) can be built without the Chinese state-owned company – CGN, which has a 20% stake in the project. Ian Duncan-Smith has described Sizewell as "*the next Huawei*". Dr Paul Dorfman, of University College London's energy institute and founder of the Nuclear Consulting Group, said it was hard to see who else would invest in Sizewell if the Chinese pulled out. (16)

The UK Secretary of State for Business, Energy and Industrial Strategy, Alok Sharma, is of the view that the proposed SZC is not likely to have significant effects in any other states outside of the UK. The Planning Inspectorate provided information about possible transboundary environmental impacts according to international conventions as part of its review of the DCO application for Sizewell C. "*Taking into account the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment (EIA) in a Transboundary Context (the Espoo Convention) and the UNECE Convention on access to information on environmental matters (the Aarhus Convention), the UK government has chosen to inform all signatory states and their public of the Proposed Development and invite their participation in the decision making process*," the Planning Inspectorate said. (17) Attracta Uí Bhroin, environmental law officer with the Irish Environmental Network, urged the Irish public to make their views on the plant known. "*The fact that it's not on the west coast of England might make people think it's not so important but that is irrelevant. Chernobyl was a lot further away and we still received radiation from that,*" she said. "*The possibility of something going wrong is very low but there is no going back from the ramifications if something does go wrong. Three Mile Island, Chernobyl and Fukushima have shown us that*." (18)

SZC cannot be completed until at least 2034. Yet carbon emissions generated during the construction phase - the carbon content of the materials and labour - will take six years to be paid off by the output of SZC, if we assume EDF's average carbon reduction forecast. But EDF's extrapolation of grid intensity to 2050 takes no account of the UK government's legally binding commitment to make to bring all greenhouse gas emissions to net zero by 2050. This means that SZC will effectively cease to contribute to emissions reductions well before 2050 and will, in fact, make a net addition. (19)

Bradwell B

Several commentators have said the Chinese Company - CGN's - hopes of building its own reactor at Bradwell now look politically highly unlikely amid hostility to China. (20) The Chancellor, Rishi Sunak, refused to rule out a U-turn on the involvement of China in the building of Bradwell B, in an interview on LBC radio. He said the Government's position hasn't changed adding "*decisions haven't*

been made" for the project. Mr Sunak said he thought the UK should have an "*eyes wide open relationship with China*". (21)

In early March, CGN revealed its plans for a Stage 1 public consultation on Bradwell B on the eve of the coronavirus lockdown. Despite pleas for the consultation to be aborted since public participation was heavily constrained, they ploughed on – the consultation closed on 1st July. The plans unleashed a firestorm of protest on both sides of the Blackwater Estuary and the proposals were torn to shreds both in principle and in measured, carefully articulated detail. The sense of outrage was palpable.

A Planning Application for site investigations which was lodged with Maldon District Council drew a large number of objections and councillors unexpectedly rejected it. (22) Maldon District Council previously backed proposals for Bradwell B plant in principle, but councillors have now voted to review their position. (23) On 12th August there was unanimous agreement from Colchester Borough Council to oppose Bradwell. (24)

The NFLA submission to the First Stage Consultation is here: https://www.nuclearpolicy.info/wp/wp-content/uploads/2020/05/NFLA_New_Nuclear_Monitor_No61_Bradwell_B_S1_submission.pdf

Wylfa

Proposals to build a nuclear power station on the Island of Anglesey are refusing to die. A decision on planning consent was due to be made on 30th September, having been postponed twice already, but this was delayed yet again until 31 December, after a request from Horizon Nuclear Power. It has emerged that Duncan Hawthorne, chief executive officer of Horizon wrote to Business, Energy and Industrial Strategy (BEIS) twice in recent days asking for an extension because "*third parties … have expressed an interest in progressing with the development.*"

US energy giant Westinghouse is "believed" to be reviving its interest in the Wylfa site – after losing out to Hitachi eight years ago. (25) Westinghouse's AP1000 nuclear design has successfully completed a Generic Design Assessment by UK regulators. (26)

Trawsfynydd

Meanwhile a development company, to be known as Cwmni Egino, is being set up to exploit the economic benefits of small modular reactors and associated technologies on the Trawsfynydd site in Snowdonia This will include a potential medical research reactor, to provide a secure and sustainable supply of medical radioisotopes. (27)

Moorside

A so-called "clean energy park" is being proposed by a team set up under Cumbria Local Enterprise Partnership (LEP). A small, light-water reactor has been proposed by the Rolls-Royce SMR Consortium, and EDF Nuclear New Build and partners has proposed building two EPR-type reactors. A finance model for this would need to be agreed with the Government. (28)

According to the brochure, the Moorside 'Clean Energy' Hub could result in the development of new nuclear plants, linkages with renewable energy generation, and hydrogen. (29)

Hinkley Point C

EDF has been fined €5m (£4.5m) by the French financial regulator for misleading investors about the cost of Hinkley Point C (HPC). They told investors in October 2014 that the terms of its deal with the UK government were "unchanged" from the 2013 agreement when, in fact there had "*been significant changes*". Henri Proglio, EDF's chief executive officer at the time, was fined €50,000. (30)

A new report from Professor Steve Thomas, and Alison Downes claims that EDF has no credible means to finance the Hinkley Point C (HPC) project. In November 2019, BEIS acknowledged that EDF had refused the credit guarantees offered by the UK Government. It was obvious by early 2017 that, because about 70 critical welds needed repair at Flamanville including eight that would require robotic techniques that did not exist then, that there was no hope that EDF could fulfil one of the conditions of the guarantee – that Flamanville was operational by the end of 2020. (31)

EDF initially anticipated taking only a 45-50% stake in Hinkley (about £6.3bn - £7bn), with other investors including CGN taking the rest. But the other investors never materialised leaving EDF with 66.5% of the project. By 2019, the expected cost had increased to £21.5-23.2bn so EDF's share jumped to up to £15.5bn.

The Covid-19 pandemic is threatening delays and further cost increases in the construction of the Hinkley Point C. France's Court of Audit warned that the HPC project "*weighs heavily*" on EDF's balance sheet. EDF ended 2019 with net debts of €41bn (£37bn), €7.7bn (£7bn) worse than a year earlier. The auditor warned that the eventual profitability of HPC, which has been revised downwards repeatedly since it was signed off, could fall further still. (32)

"It is hard to avoid the conclusion that EDF has been proceeding with HPC since as long ago as 2015 on the assumption that the HPC project and EDF as a whole is too big to fail and that some means of supporting it will emerge."

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2 Hunterston

On 27th August, the Office for Nuclear Regulation (ONR) announced it was giving EDF permission to restart Reactor 3 at Hunterston B for a limited period – generating up to a total of 16.425 Terawatt days, approximately six months' operation. (1) Then on 24 September ONR gave EDF permission for Reactor 4 to return to service for a similar limited period. By the end of September both reactors were operating. (2)

Following the Reactor 3 announcement, EDF said it is hoping to run both reactors at the site for two last six-month periods each and then begin decommissioning them "*no later than 7 January 2022*". The reactors were previously scheduled to be shut down in March 2023.

ONR has yet to give permission for either reactor to operate for a second six months, and this will require new safety cases.

The NFLA and campaigners have condemned the moves to restart Hunterston, warning that public health is being put at risk. They are calling for the plant to be permanently closed down now. "*The safest thing to do is to close Hunterston B and start accelerated decommissioning of its reactors*," said the group's Scottish convener, Glasgow SNP councillor Feargal Dalton. "*We totally disagree with EDF that decommissioning should start in 2022. It should happen now for the sake of public safety*." He added: "*The fact it has taken two years and much resource from EDF to provide sufficient information to the ONR to allow a restart to take place is indicative of the level of risk over the structural integrity of these reactors*." (3)

Reactor three has an estimated 377 cracks in its graphite core and has been shut down since 9 March 2018. It will only be allowed to operate for six months before it will have to close down again so that its core can be checked for new cracks. Then EDF will need new permission to operate it for a further, final six months.

Reactor four at Hunterston has an estimated 209 cracks in its core, and was shut down on 2 October 2018. It was allowed to restart for four months in 2019.

According to the Daily Business website, EDF employs approximately 580 workers (and around 200 contractors). About 125 will lose their jobs in January 2022 with others retained until 2025 for the

de-fuelling process. (4) After that, there will be the massive task on dismantling the two reactors safely.

Dr Richard Dixon, director of Friends of the Earth Scotland said "*Whether it was clever press strategy or fluke, EDF managed to use the closure announcement to bury the news that their damaged reactor is starting up again. They must be laughing all the way to the bank*." (5)

West Kilbride Tory councillor Todd Ferguson called for Hunterston to be shut immediately. He said Hunterston should not be a 'guinea pig' for the UK nuclear industry testing how long power stations can last. "*There comes a time when the reactors should remain offline for good. The North Ayrshire Conservative Group believe the time to look at this is now*." (6)

The NFLA Scotland Forum have joined with Friends of the Earth Scotland, WWF Scotland, CND Scotland and the Nuclear Consulting Group to raise serious concerns over the decision of the Office for Nuclear Regulation (ONR) to allow these reactors to restart. It is important to note that the majority of the Scottish population live downwind of Hunterston B and the consequences of an accident will be catastrophic. In terms of the energy generation issues by closing Hunterston B, it needs to be noted that EDF Energy has recently been asked by the National Grid to reduce output at Sizewell B in Suffolk due to a lack of energy demand, providing it with £50 million in order to do this. With the reducing cost and increasing levels of renewable energy coming on stream there is absolutely no need to restart Hunterston B. Restarting for 6 or 12 months is creating an unnecessary risk to the people of Scotland. If accelerated decommissioning of the site was to take place, many jobs can be diverted into such activity for some time to come. In addition, whilst there is fuel in the reactor, it is a criticality risk and has to be almost fully staffed until it is defueled in 2025. (7)

The latest technical documents (8) put online by the Office for Nuclear Regulation (ONR) show:

1. EDF has predicted that the number of cracks in reactor three's graphite core will increase from the current 570 to 781 after six months operation, and to 943 after 12 months operation. 943 cracks would bring the reactor close to EDF's new "damage tolerance level" of 1,331 cracks, and exceeds its "intermediate damage tolerance assessment" of 905 cracks.

2. EDR has scrapped its "operational allowance" for cracks, which in 2018 was 350. It now says that the safety limit is its "Currently Established Damage Tolerance Level" of 1,331. So, the acceptable number of cracks has nearly quadrupled in two years.

3. EDF has done new analysis of "in-event cracking" to assess the damage that a one-in ten-thousand-year earthquake could do if it occurred in the next six months. This predicts that "overloads" would cause an additional 500 cracks.

The ONR report also contains some interesting remarks on EDF assessments. It says for example that the company's estimates of the likelihood of fragments of debris broken off graphite blocks "migrating to safety significant locations" are "inherently subjective". It also suggests that EDF's safety case methodology is "approaching its limit of viability".

Despite all this of course, ONR bought EDF's argument that it should be allowed to operate for another six months. But maybe getting ONR's permission for a second six months' operation - as EDF want - is not certain.

Jobs

Nicola Sturgeon has promised to look into job fears surrounding Hunterston's closure. Calls have been made for the Scottish Government and North Ayrshire Council to create a plan for the workforce. Nicola Sturgeon said the government is committed to creating new employment locally. Conservative MSP Jamie Greene says the impact of the decommissioning will be huge and insists local people will need extra support. Kenneth Gibson, the SNP MSP for the area, says work needs to be done quickly to support jobs and that officials must look towards a green future. He said: "*The decision should encourage the Scottish and UK Governments to work in partnership with the council to deliver the economic transition of the area with a greater sense of urgency. Whilst defuelling will mean no immediate job losses, investment locally in green, clean energy is now the priority*." (9)

- EDF Energy has announced that it intends to submit new safety cases to ONR to re-open Reactors 3 and 4 at Hinkley Point B – Hunterston's sister reactors. It currently expects reactor 4 to return to service on 26 February 2021 and reactor 3 on 12 March 2021. The Stop Hinkley Campaign is calling for both reactors to remain closed. Stop Hinkley spokesperson Roy Pumfrey said: "*Nuclear engineer, the late John Large said more than a decade ago that it was gambling with public safety to allow reactors with cracks in their core to keep operating. Every minute these reactors operate that gamble become riskier. We call upon the UK Government to intervene and request the ONR to re-consider their unwise decisions at Hunterston B and to refuse to accept EDF's safety cases for Hinkley Point B. It is EDF in Paris, France which will benefit from the restart of these reactors, but it is those of us who live in Somerset and middle England who are being exposed to these involuntary risks*" (10)

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3 Torness

The MSP for East Lothian, Iain Gray, who will not be standing for re-election in May, has called for thought to be given to extending the life of Torness, which employs about 500 people. The Labour MSP said: "*Torness Power Station has brought many positives to East Lothian, including providing hundreds of skilled jobs and apprenticeships, and contributing tens of millions of pounds to the local economy each year*." (1)

In fact, a recent Office for Nuclear Regulation (ONR) Assessment Report said cracks – like the ones in the graphite core at Hunterston which are causing safety concerns - are now expected to start appearing at Torness six years sooner than previously expected - 2022 rather than 2028. Logically, therefore, we should be preparing for Torness to close six years earlier in 2024, not extending its life. (2)

Meanwhile, ONR, has granted permission for the statutory outage on reactor 1 at Torness to be postponed until January 2021. It was due to be taken off line on Friday 24 July for around 11 weeks for an extensive maintenance period, known as a "statutory outage". This outage would have brought more than 700 extra workers to the site at a time when communities are still concerned about the spread of Covid19. Consideration was given to reducing the scope of the outage to limit the additional people on site but it was concluded that postponement, with the support of the regulator, was the most appropriate option. (3)

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4 Nuclear Decommissioning Authority

The Nuclear Decommissioning Authority (NDA) has published its fourth Draft Strategy for the period 2020 – 2025 and begun a 12-week public consultation, closed on 8th November.

NDA Draft Strategy for Consultation 17th Aug 2020

https://www.gov.uk/government/consultations/nuclear-decommissioning-authority-nda-draft-strategy-for-consultation

The NDA is charged with decommissioning and cleaning up 17 nuclear sites, three of which are in Scotland – Hunterston A, Chapelcross and Dounreay. Due to the current Government guidance around social distancing, the NDA will be holding a series of virtual meetings and briefings, and a bespoke virtual stakeholder event mid-way through the consultation period – where stakeholders will have the opportunity to discuss the details with authors of the draft strategy. These responses will be considered in developing the final Strategy – which will be submitted for approval to UK and Scottish Government, ahead of publication by April 2021.

The NDA's mission will take over 100 years to complete and it is estimated to cost in excess of £120 billion to deliver. Facilities more than 60 years old were neither designed nor operated with decommissioning in mind The NDA's aspiration is that at least one of its sites will be fully decommissioned and released for its next planned use by 2040.

The Magnox sites have already achieved significant risk and hazard reduction through defueling and transporting the remaining spent fuel to Sellafield. All plutonium stored at Dounreay has been moved to Sellafield.

The NDA says it is now working closely with UK government on options relating to decommissioning the Advanced Gas-Cooled Reactors (AGRs), and waste and decommissioning activities associated with the Ministry of Defence (MOD) owned liabilities. (These are collectively termed non-NDA liabilities). If the NDA is best placed to take on the management of new liabilities, and can make savings for the taxpayer, without adversely impacting its core mission, it will do that.

The NDA is already contracted to manage a number of non-NDA liabilities which include domestic (e.g. EDFE and MOD) and overseas customers. The range of contracted services includes spent fuel and radioactive waste management e.g. the management of a quantity of Atomic Weapons Establishment (AWE) Higher Activity Waste (HAW).

NFLA Response

There are five main points which NFLA would like to make about the NDA's Strategy for the next five-year period:

In the absence of agreement between the NFLA and the NDA on nuclear waste management in general and the waste hierarchy in particular, we think it is incumbent on the NDA to provide stakeholders at each of its sites with an inventory of waste already present and which will be produced during the decommissioning process along with its likely proposed destination which allows for easy understanding and comparison to the NFLA demand that if any part of a nuclear site is proposing to allow unrestricted use, it must be able to show that doses to members of the public will be of the order of 0.01mSv or less per year. This process should allow local authorities which are expected to host waste management facilities off-site – such as landfill sites, and local authorities on transport routes - to be part of the conversation.

Any proposals for the management of Higher Activity Waste (HAW) in near-surface facilities needs to follow the Scottish policy of requiring that facilities are monitored and have a capability to retrieve waste packages if necessary.

It is noted that Sellafield Ltd could be allowed to increase certain discharges for a certain length of time, in order to carry out a particular decommissioning task, provided it has submitted an acceptable Best Available Technique (BAT) case. Unfortunately, it is not clear from the document whether any superior abatement techniques have been rejected on, for example, cost benefit grounds, or what research is going on so that discharges to the sea can be further reduced. This flexible approach should require the NDA to regularly consult stakeholders and members of the public on the use of BAT.

We hope the NDA, in conjunction with EDF Energy, will seriously consider an early AGR decommissioning project for Hunterston B.

The NDA should recommend to Government that it drops the idea of re-using plutonium as MoX fuel.

Some highlights from the Strategy document include:

Intermediate Level Waste Disposal

The NDA says a proportion of Intermediate Level Waste (ILW) that could be disposed of in near surface disposal (NSD) facilities and it has initiated an investigation to explore the technical feasibility of this. The NDA points out that Scottish Policy for the management of Higher Activity Waste (HAW) is long-term management in near-surface facilities. But it is important to emphasise that, Scottish Policy requires that disposal facilities should be monitored and there should be a capability to retrieve waste packages and waste if necessary."

The NDA Draft Strategy highlights graphite as a possible candidate for NSD. A 2006 Nirex Technical Note pointed to the possibility of Carbon-14 combining with CO_2 and Methane and escaping in gaseous form from a deep repository relatively quickly. But CoRWM pointed out in a 2009 report that disposal at depths greater than 100 metres may be necessary because of the potential for Chlorine-36 migration from graphite. It is also known that the UK Environment Agencies consultation document on Guidance for Near Surface Disposal published in 2008 suggested that only short-lived ILW was suitable for near surface disposal (thus excluding graphite). However, after representations from the industry this was changed to allow for certain types of long-lived intermediate level waste (ILW) – in particular graphite - to be disposed of in a near-surface facility.

Oxide Spent Fuels

The strategy is to consolidate all of the NDA's spent fuels at Sellafield including fuels managed on behalf of other organisations such as the Ministry of Defence (MOD). Reprocessing at the Thermal Oxide Reprocessing Plant (THORP) finished in 2018. The NDA currently hold about 2,000 tonnes of spent AGR fuel at Sellafield but by the time defueling of the AGR power stations finishes, within the next 15 years, this is expected to increase to about 5,000 to 6,000 tonnes. It will need to be cooled

for several decades before it can go to a Geological Disposal Facility. According to the current plan, the GDF wouldn't be able to receive spent fuel until 2075.

Magnox Reactors

The successful completion of defueling at Wylfa power station in September 2019 means that all spent Magnox fuel has now been consolidated in the Fuel Handling Plant (FHP) at Sellafield. The NDA intends to reprocess as much of this fuel as possible. The plan was to close the Magnox reprocessing plant at the end of 2020, but because it was closed during the lockdown, this has been extended to 2021.

Any remaining fuel is expected to be transferred into dry storage. Some degraded metal fuels remain in or have been recovered from legacy ponds. As much of this material is heavily degraded it is not suitable for reprocessing. The NDA expects that, following a period of dry storage for several decades, the fuels recovered from the legacy ponds will be conditioned and disposed of as waste in a GDF. The NDA says it is now confident that the approach developed for highly degraded fuels from the legacy ponds could potentially be used to manage any remaining spent Magnox fuel when the Magnox reprocessing plant closes.

One of the so-called Exotic Fuels being transferred to Sellafield is the Dounreay Fast Reactor spent fuel. The strategy is to reprocess as much of it as practicable before the Magnox reprocessing plant ceases operations. Any remaining DFR material will be transported to Sellafield and placed into dry storage. By early 2020, about half of this material had been shipped to Sellafield and reprocessed.

A review of the decommissioning strategy for Magnox reactors has concluded that deferred decommissioning is not appropriate as a blanket strategy for all reactors so a site-specific approach involving a mix of decommissioning strategies will be taken in future. For some sites this will result in decommissioning being brought forward whilst for others a deferral strategy with varying care and maintenance periods will be the chosen approach. Magnox Limited will now prepare a business case (or cases), informed by local and national stakeholder views, for implementing this strategic change. Trawsfynydd has been chosen as a lead site for final decommissioning. This is primarily because the external structure has degraded extensively since it was shut down in 1991 such that substantial amounts of work would be required to make it safe for a long period of deferral; work that would then need to be undone to complete reactor dismantling. The intention is that the strategy will result in a rolling programme of Magnox decommissioning.

All Magnox reactor buildings will not be demolished until 2105. After this date no more LLW or ILW will be produced. The NDA expects all Magnox ILW to be disposed of by 2105, but in Scotland ILW won't be 'disposed' of until 2314. All Magnox land will be designated or reused by 2314.

Plutonium

70 years after starting to produce plutonium the UK now has a stockpile of 140 tonnes, the largest in the world, but no use for it. It is also managing around 23 tonnes of foreign, (mainly Japanese) owned plutonium. Some of the older plutonium packages and facilities at Sellafield are now considered by the NDA to be amongst the highest hazards on the site. Consequently, repackaging and treatment of some packages to stabilise them will be required. The cost of managing the

indefinite storage of plutonium is expected to increase by between £0.5 - £1bn from the current estimate of £3.5bn. It will take around 40 years to repackage all the plutonium. (1)

A major new specialised facility is required to do this known as the Sellafield Product and Residues Store Retreatment Plant (SRP), but it may be almost ten years before this starts operation. Yet some of the plutonium facilities and packages are in such a poor condition they require urgent attention, so some packages need to be promptly repackaged now in existing facilities. When the new SRP plant becomes available the contents of these containers will be treated and then repackaged again into containers suitable for long-term storage. (2)

The NDA is actively working on developing credible options to put the plutonium inventory beyond reach to reduce the burden of long-term security risks and proliferation sensitivities for future generations to manage. Any long-term management solution will take many decades to fully implement. Some of the plutonium could be used to make MoX fuel for use in nuclear reactors, but some of it wouldn't be suitable for that. The NDA continues to work with technology suppliers, developers, regulators and the UK government to establish how both reuse and immobilisation options could be implemented. (3)

Some of the plutonium moved from Dounreay presents unique management challenges due to its form and storage configuration which will require increased focus in the coming years.

Highly Enriched Uranium

A total of 6 shipments of HEU by air to the USA were carried out between 2016 and 2018. The NDA says the successful completion of the project represents an important milestone in the programme to decommission and clean-up the Dounreay Site. The plan, originally, was to transfer all the HEU to Sellafield.

Socio-Economics

Economic studies commissioned by the NDA show its work supports around 40-50,000 jobs at or near its sites. In West Cumbria (Copeland and Allerdale district councils) around half of all jobs are either at Sellafield, part of its supply chain or dependent on the salaries of Sellafield and supply chain workers. Similarly, around 10% of the jobs in Caithness are dependent on Dounreay and around 5% of the jobs in North West Wales (Anglesey and Gwynedd) depend on Magnox. The impact around other Magnox sites is more localised, albeit Hunterston, Chapelcross and Dungeness have high levels of economic deprivation, making Magnox an important regional employer.

In Dounreay, decommissioning will reduce in the 2020s and 2030s with a consequent impact on employment. There are good existing mechanisms in place for local agencies to work together on economic support and diversification. The NDA is a member of the Caithness and North Sutherland Regeneration Partnership (CNSRP) which draws together major public sector bodies, including Scottish Government, the Highland Council and Highland and Islands Enterprise.

Sellafield

All High-Level Waste should be treated and placed in storage by 2030. It will take until 2046 before all legacy waste has been retrieved. Until 2060 to repackage all the plutonium. The NDA hopes that all HLW will be disposed of by 2104; all ILW treated and disposed by 2120. All buildings will be decommissioned by 2125 and land designated (i.e. land that has been assigned to the NDA by the UK government for decommissioning and remediation) or re-used.

Dounreay

The Dounreay site won't be available for other uses for 313 years, according to the NDA Draft Strategy, and waste should be removed from the Shaft by 2029. The shaft is 65.4 metres deep. Radioactive waste was dumped there, as well as more than 2kg or sodium and potassium. from 1959 to 1977, when an explosion ended the practice. (4)

Dounreay was only home to functioning nuclear reactors for 39 years, the clean-up will take roughly ten times as long. Part of the demolition process has involved the use of a remote controlled robot nicknamed the "Reactosaurus", a 75-tonne device with radiation-proof cameras, and robotic arms which are able to reach 12 metres into the reactors where they can operate an array of size-reduction and handling tools, including diamond wire and disks and hydraulic shears.

The site also leaked radioactive fuel fragments into the sea in the local area for decades, between 1963 and 1984. The dangerous pollution affected local beaches, the coastline and the seabed. Fishing has been banned within a two-kilometre radius of the plant since 1997. Milled shards from the processing of irradiated plutonium and uranium, are roughly the size of grains of grains of sand. The most radioactive of the particles are believed to be potentially lethal if ingested. These small fragments are known to contain caesium-137, which has a half-life of 30 years, but they can also incorporate traces of plutonium-239, which has a half-life of over 24,000 years. (5)

The most contaminated areas of the site are found in the Fuel Cycle Area (FCA) facilities, which examined and reprocessed spent nuclear fuel. The nature of the facilities means that the most contaminated areas are generally also the most inaccessible. The site is collaborating with the Robotics and Artificial Intelligence in Nuclear (RAIN) Hub, a consortium of universities led by the University of Manchester, to explore ways to overcome some of these challenges. A group of scientists from RAIN carried out trials earlier this year in the FCA laboratories of a small remotely operated vehicle (ROV) equipped with sensors, cameras and a manipulator 'arm', which provided useful information. (6)

- The Nuclear Decommissioning Authority (NDA) has announced that Dounreay Site Restoration Ltd (DSRL) [and LLW Repository Ltd (LLWR)] will become wholly owned subsidiaries of the NDA next year. DSRL ownership will transfer to the NDA from the Cavendish Dounreay Partnership, a consortium of Cavendish Nuclear, Jacobs and Amentum, in March 2021. (7) Local MSP Gail Ross has been given an assurance that no jobs will be lost. NDA chief executive David Peattie said it is part of a plan to "*drive more effective and efficient nuclear clean-up and decommissioning*" – the very motivation for privatising it in the first place. (8)

- Dounreay has awarded a contract to clean-up the shaft to Nuvia. Work to remove waste from the shaft at Dounreay will begin later this year. The £7.5 million contract is for "advanced transition works" at the 65m-deep shaft and silo. (9)

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5 Dalgety Bay

Work to remove radioactive pollution from the beach at Dalgety Bay which was finally due to begin in July has been delayed yet again. The MoD has confirmed the removal of hazardous waste from the coastline will not begin until at least April 2021, blaming problems in securing the correct licences as well as the need to protect local wildlife, for the latest delay. (1)

The project has been pushed back on several occasions and work finally should have started in April but faced setbacks due to the coronavirus outbreak. Then in June the Dunfermline Press (2) reported the unexpected news that work would start in July and continue until September and then be put on hold until April 2021. It cannot continue over the winter months, as Dalgety Bay is home to wading birds which spend the winter there. Balfour Beatty were expected to start the clear-up in July, but then nothing happened.

More than 3,000 radioactive particles have been found at the beach, in nearby gardens and next to Dalgety Bay Sailing Club, and restrictions were put in place in 2011, with parts of the beach fenced off and fishing banned. The MoD finally accepted responsibility and defence chiefs agreed a plan to remove the pollution in July 2014 but there have been continual delays. Last November, the MoD

blamed local stakeholders for the slow progress, saying they were "*dragging their feet*", only for the sailing club, the main landowner, to hit back at their "*bullying tactics*". They said the suggestion they were at fault was "*completely unfounded, inaccurate and misleading*". (2)

The South and West Fife Area Committee received an update on 7th October on the planned remediation of radiation contamination by the MOD, but despite a request to attend, the MOD did not, and the update was left to SEPA. SEPA stated they were disappointed by the lack of communication and confirmed that they had received no application and no paperwork from the MOD on the permitting required to proceed with works. Cllr David Barratt commented: "*This is no way to treat local communities or elected representatives and the MOD's behaviour is duplicitous*." (3)

10. Courier 27th Aug 2020 https://www.thecourier.co.uk/fp/news/local/fife/1530643/removal-of-radioactive-contamination-from-fife-beach-delay-until-2021/
11. Dunfermline Press 17th June 2020 https://www.dunfermlinepress.com/news/18522735.dalgety-bay-radiation-clean-up-start-july/
12. https://www.facebook.com/CllrBarratt/photos/a.253423595163913/1015938032245795/

6 Local Energy Companies

Nicola Sturgeon has been under fire for her failure to fulfil a promise to create a publicly owned power company made at the SNP Conference in 2017. A case study was carried out by consultants EY, at a cost pf more than £300,000. Another "outline business case" study, costing £100,000, was also conducted in 2018 but has still to be published. A Scottish government spokesman said it remained committed to developing the public energy company in partnership with local authorities. He said: "An independent outline business case has been completed. Discussing the outcomes and agreeing the next steps with interested local authorities has been interrupted by coronavirus restrictions and the pressure of other work required in response to the crisis. We will resume discussions as soon as possible, publish this report once it has been fully considered and will keep parliament updated on subsequent progress." (1)

Meanwhile, British Gas has acquired Robin Hood Energy after the company fell into heavy debt and has made more than 250 employees redundant. Robin Hood's 112,000 residential customers and 2,600 business clients will transfer to British Gas over the next few months. (2) An external auditor's report made clear, whilst the city council has successfully run other companies, the energy market is particularly complex and challenging and they didn't have strong enough arrangements in place to protect the public money invested. (3)

Bristol Council has sold the energy supplier it founded in 2015 for a hefty loss to Clydebank-based Together Energy for £14m. The sale will recoup only a fraction of the estimated £35m that the council has spent on Bristol Energy in the last five years, but has saved more than 110 jobs. The deal means Together Energy will acquire 155,000 residential customers plus the Bristol Energy brand and

systems. Earlier this month, Bristol Energy sold its 4,000 business customer accounts to supplier Yü Energy for £1.3m. (4)

Barking and Dagenham Council has announced its intention to sell the customer book of BEAM Energy, and shift its focus to renewable energy. The energy supplier was a product of a partnership with Robin Hood Energy. Beam will now turn its focus to renewable energy the council said, working to ensure all homes in Barking Dagenham have affordable renewable energy systems like heat pumps, solar panels, insulation and electric charge-points. (5)

Hailed initially as visionaries and pioneers, Nottingham Councillors who set up Britain's first not-for profit, municipal energy company since 1948 are now being pilloried for its 'failure'. Former Nottingham Labour MP Alan Simpson says: "*Instead of this being a story about how rigged and crooked the UK energy market is, it has become a stick with which to beat municipal enterprise. Instead of asking why such companies flourish elsewhere in Europe - but not in Britain - it is being used as a way of telling the public sector to keep out of domains in which private companies have systematically fleeced the poor*."

Stephen Cirell says the requirement to purchase energy well in advance in order to secure the best prices is really problematic for small entrants to the market. This fact and a downturn in market prices caused losses that had not been predicted. (6)

100% renewable electricity supplier, Bulb energy, for instance, is racing into the clean energy market whilst making a loss of £129m last year. Backed by US and Russian hedge fund money, it is presumably a safer bet. Octopus Energy, also a 100% electricity supplier, made a loss of £35m last year. Short term losses aren't the problem. As long as shareholder dividends are paid and company expansion continues, such losses are just accommodated.

Simpson says "*Since privatisation, Britain's energy market has been rigged in favour of big, centralised (and dirty) energy … in Germany [people] have a right of local supply; meaning they can sell electricity surpluses to themselves, at prices closer to wholesale than retail charges. In practice it meant that villagers were paying €0.13cents/kWh as opposed to the €0.27cents/kWh retail price. Of course, people were happy. Everyone talked about the importance of saving the planet. It's just so much easier to do so when your bills are cut in half too. In Britain, Ofgem and big energy suppliers have always opposed such a right. It would mark the death of their oligopolies. It would mark the end of short-term, investor-driven priorities, the end of putting increased production ahead of carbon reduction*."

If Robin Hood Energy, and other local energy companies, had been allowed to go down this path we would have been faced with a genuine energy revolution. Instead of being just bulk buyers of electricity, local energy companies could have become producers too.

- People's Energy is partnering with East Lothian Council to launch East Lothian Energy in a bid to tackle fuel poverty in the Scottish area. Two discounted tariffs – a fixed tariff and a variable tariff - will be offered to residents of East Lothian as part of the joint initiative, with up to £200 of annual savings possible. Customers of the new supplier will also be able to benefit from East Lothian Energy's pledge to pay back 75% of profits to all domestic

customers through an annual rebate, although this will only happen once the supplier is profitable. It is hoped that offering affordable and sustainable energy - with both tariffs offering 100% renewable energy - through East Lothian Energy will help to eradicate fuel poverty in the area. According to People's Energy, it is estimated that 22% of households in East Lothian are living in fuel poverty. (7)

- People's Energy is to create 100 jobs at a Selkirk office slated for closure. People's Energy is setting up a customer service facility as their firm launches into the prepayment meter market with the aim of bringing these tariffs down to the same level as those paid by direct debit customers. The move is part of the social enterprise's goal to eradicate fuel poverty. People's Energy launched in August 2017 with £500,000 generated through a crowdfunding campaign. It expanded into the business energy market in September 2019, and currently supplies its 100% renewable energy to 180,000 customers. The office was originally the headquarters of Spark Energy, which was rescued from collapse in 2018 by SSE. Ovo Energy completed the acquisition of SSE's retail arm in January of this year, but was planning to close the Selkirk office which employed 380 people. (8)

1. Times 21st June 2020 https://www.thetimes.co.uk/edition/scotland/nicola-sturgeon-criticised-over-failed-pledge-to-deliver-public-power-company-hp7m7wpqv
2. Telegraph 3rd Sept 2020 https://www.telegraph.co.uk/business/2020/09/03/british-gas-snaps-jeremy-corbyns-energy-supplier-robin-hood/
3. Nottingham Post 12th August 2020 https://www.nottinghampost.com/news/nottingham-news/nottingham-mps-react-damning-robin-4419820 and Nottingham Post 14th Aug 2020 https://www.nottinghampost.com/news/nottingham-news/robin-hood-energy-what-happens-4423849
4. Telegraph 8th Sept 2020 https://www.telegraph.co.uk/business/2020/09/08/council-owned-bristol-energy-sold-huge-loss/
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7. Current News 20th Aug 2020 https://www.current-news.co.uk/news/peoples-energy-launches-new-local-supplier-to-tackle-fuel-poverty
8. Herald 4th Aug 2020 https://www.heraldscotland.com/business_hq/18625893.peoples-energy-create-100-jobs-selkirk-office-slated-closure/

7 Just and Green Recovery

The Scottish Government's Advisory Group on Economic Recovery report published in June was a disappointment to many. Caroline Rance, Friends of the Earth Scotland Climate and Energy Campaigner, said: "*The First Minister has spoken of the need for a green recovery which delivers a wellbeing economy but today's report fails to chart the path to a greener, fairer Scotland for*

everyone. Today's advice offers little in the way of new thinking or concrete measures that will challenge the inequalities, poverty and climate pollution in Scotland. A return to the way things were before coronavirus is both unrealistic and unwanted." (1)

The Advisory Group, led by Benny Higgins, former Tesco Bank chief executive, wants Scotland's devolved government to be able to borrow £6 billion to invest in that recovery. That's three times what an earlier Higgins-crafted initiative, the Scottish National Investment Bank, will have available to lend over a ten-year period when it opens its doors later in the year. (2)

In August Cabinet Secretary for the Economy, Fair Work and Culture, Fiona Hyslop set out key actions the Scottish Government will take. The Scottish government endorsed many of the proposed measures, including investing £50 million to support youth employment and making it easier for smaller firms to compete for public sector contracts. Higgins said: "*The grand challenge for the Scottish government is to achieve both robust economic growth and job creation, alongside ensuring the economy is based on tackling fairness, inclusion and sustainability*." (3)

But environmental campaigners labelled the plans "*a woefully inadequate response to the scale of the challenges we face from Covid-19 and the climate emergency. It's disappointing that the government has not taken this opportunity to adopt the recent recommendations of the Just Transition Commission including a large-scale fossil fuel decommissioning programme, public investment in renewable manufacturing facilities, buying fleets of green buses for local authorities and doubling energy efficiency budgets*." (4)

Higgins, on the other hand, warned that "ideological zealots" in the green movement risk wrecking the economy.

Just and Green Recovery Scotland - a cross-sectoral campaign working for a holistic, radical response to the dual crises of coronavirus and climate change, backed by over 80 organisations from churches to charities, Trade Unions and community groups – said the Scottish Government's 'Economic Recovery Implementation Plan' (5) failed to set out a clear and ambitious path to recovery on the scale we need. Instead we saw the Scottish Government offer a long list of things that they were already doing and very few new ideas.

The recovery from Coronavirus is a rare chance to markedly accelerate the repurposing of government away from the prioritisation of economic growth and towards goals of wellbeing and sustainability, ending inequality and environmental destruction. Scotland needs a new economic strategy to this effect.

The Campaign for a Just and Green Recovery spells out 5 key areas for action if we want a Just and Green Recovery for Scotland that creates a fairer country and a safer world. (6) One of the five points deals with climate action and nature recovery, calling for instance, for green jobs to be created in sustainable travel, home energy efficiency retrofits, installing heat pumps and district heating networks, with ambitious green employment opportunities for young people and support for retraining where whole industries are affected.

Programme for Government

Environmental campaigners welcomed the Programme for Government which included £1.6 billion in heat and energy efficiency in our homes and buildings over 5 years. (7) The £1.6bn will be spent directly supporting up to 5,000 jobs and tackle fuel poverty as part of an enhanced Green New Deal. Scotland is set to update its Climate Change Plan by the end of the year. The new spending will see an additional £500m spent on nature-based solutions in the country, including £150m to increase woodland creation by 50% by 2024 and another £150m on flood risk management.

The Scottish Government is right to focus on energy use in people's homes says FoE Scotland Director, Dr Richard Dixon. One of the biggest and earliest commitments in the document is to a big expansion of the work to insulate buildings and switch heating systems to low carbon. In her speech, the First Minister said that in 20 years heating our homes will no longer contribute to climate change emissions. (8)

The Energy & Climate Intelligence Unit says "Somewhat handily for decision-makers in Whitehall, the Scottish Government's latest Programme for Government contains a good outline of what ambition looks like." (9)

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3. Times 5th Aug 2020 https://www.thetimes.co.uk/article/coronavirus-in-scotland-green-zealots-risk-wrecking-recovery-top-economic-adviser-warns-lhd22m3ql
4. Herald 5th July 2020 https://www.heraldscotland.com/news/18630465.scottish-governments-strategy-kick-start-green-economy-branded-woefully-inadequate/
5. The Scottish Government's response to the Advisory Group on Economic Recovery report "*Towards a Robust, Resilient Wellbeing Economy for Scotland: Report of the Advisory Group on Economic Recovery*." Scottish Government 5th Aug 2020 https://www.gov.scot/publications/economic-recovery-implementation-plan-scottish-government-response-to-the-advisory-group-on-economic-recovery/
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8. Scotsman 7th Sept 2020 https://www.scotsman.com/news/opinion/columnists/snps-plans-low-carbon-homes-would-create-jobs-reduce-fuel-poverty-and-help-fight-climate-change-dr-richard-dixon-2963793
9. ECIU 7th Sept 2020 https://eciu.net/blog/2020/clean-heat-the-uk-government-could-do-worse-than-look-north-of-the-border?s=09

8 Committee on Climate Change (CCC) 2020 Progress Report to Scottish Parliament

The CCC's ninth annual Progress Report to the Scottish Parliament shows that Scotland's greenhouse gas emissions fell by 31% from 2008 to 2018. This was primarily due to action to reduce emissions in the power sector, where Scottish renewable electricity generation has tripled and fossil-fuelled generation has fallen by more than 70% in the last decade. However, greenhouse gas emissions increased by 2% in 2018, compared to a reduction of 3% in 2017.

Scotland must do better to hit climate change targets, warns government advisers. The CCC has called on ministers to update its planning and set out a "new era of climate change action in Scotland" which puts the nation firmly on course to become a Net Zero economy by 2045. Sustained action over the long-term "is now imperative" to meet Scotland's demanding targets, the committee said. It also wants the Scottish Government to set out a vision for the future of low-carbon heating in Scotland's homes and other buildings, integrated with UK Government decisions on the future of the UK gas grid and energy taxation. It wants ministers to devise more ways to make it easy for people to walk, cycle, use public transport, and work from home in Scotland, and ensure electric vehicle charging infrastructure and are in place to eliminate the need to buy a petrol or diesel car in Scotland by 2032 at the latest. Responding to the report, environment and climate change secretary, Roseanna Cunningham, accepted that the nation had to step things up to meet emission targets. (2)

The CCC wants Scotland to become the first UK nation to set out a net-zero-compatible plan. The Scottish Government is in a unique position to detail how it plans to deliver a green recovery when it publishes its updated Climate Change Plan in December. Doing so would put it ahead of the rest of the UK, as Scotland seeks to become the UK's first Net Zero economy by 2045. The Committee will provide further guidance on the appropriate pathway for Scottish emissions over the period to 2045 as part of its advice to Government on the Sixth UK Carbon Budget, due to be published on 9 December 2020. (3)

The Committee on Climate Change (CCC) has told the Scottish Government that it should apply learnings from the low-carbon transition in the nation's electricity sector to heat and transport, lest it risk missing its 2045 net-zero target. On transport, the report recommends an overarching commitment to ensure that no Scot needs to buy a petrol or diesel car by 2032. This vision could be achieved by increasing government investment in walking and cycling infrastructure, public transport networks and electric vehicle (EV) charging; ensuring private sector contribution in these areas and streamlining processes associated with accessing finance and planning permissions. (4)

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9 Climate Emergency

- Julian Manley recently shared his experience of working closely with Cllr Matthew Brown, Leader of Preston City Council, and other stakeholders since 2012 to facilitate the development of what has become known as the 'Preston Model' of local economic development. Manley explained how an economic and social transformation is taking place in Preston focussed on the spend of anchor institutions – the Gateway Housing Association, Preston College, Lancashire County Council, the Police and Hospitals – which spend a lot of money, employ a lot of people and are mainly publicly funded and are not going to go anywhere. The Preston Co-operative Development Network is creating a network of co-operatives that can providw goods and services to the anchor institutions. Where one of the institutions requires something that isn't made locally, if possible, a co-operative is set up to supply that requirement. **North Ayrshire Council** has also adopted a community wealth building strategy, but is perhaps focussing too much on the economic aspect and not enough on social transformation. (1)
- Small investors will be able to invest as little as £5 in green projects as councils start borrowing in small amounts from their own residents for the first time in decades. This autumn Leeds city council will become the first big metropolitan local authority to tap its own residents for funds — intended to add solar panels to city buildings — after pioneering moves this summer by smaller councils in West Berkshire and Warrington. Community municipal investments enable small investors to back projects to fight climate change and to support work in their own communities, while also giving them a near-guaranteed return of 1.2 per cent a year. Councils used to tap local residents by issuing bonds available to retail investors, but the practice died out in the 1990s, when investment was restricted to institutional investors prepared to stump up large amounts. West Berkshire district council was the guinea pig in July and so far, it has raised £600,000 of a planned £1 million from 480 investors. (2)
- Warrington Borough Council aims to raise £1m through Community Municipal Investment (CMI) rounds with the local authority issuing CMI bonds directly to the public via internet-based green investment platform Abundance. (3) The Council wants to develop a solar farm in Cirencester. Warrington Borough Council is aiming to be carbon neutral by 2030, and intends to collaborate with local residents to develop a green agenda to achieve this goal. Warrington has already installed solar PV on 3,000 local housing trust properties, delivered a large scale solar roof scheme on the OMEGA development site and acquired solar farms in York - a 34.7MWp solar farm developed by Gridserve - and Hull. (4)
- Stirling Council is to install solar canopies at its Castleview Park and Ride site. Solar panels, which will span a 1,375m2 area, will power 32 new EV chargers and generate roughly

250,000kWh annually. The solar canopies will cover 132 parking spaces. The project which will also include battery storage, received match funding through the Low Carbon Travel and Transport (LCTT) Challenge Fund. (5)

- The Edinburgh Community Solar Co-operative has launched its second share offer. Phase 2 will see at least an additional 6 public buildings added to the Co-operative's portfolio with the possibility of more being added later on in the year by means of a further share offer. The six buildings are: Edinburgh Road Services – Bankhead Depot; Kirkliston Leisure Centre; Craiglockhart Leisure Centre; Gracemount Leisure Centre; Waverley Court and Sighthill Recycling Centre. The share offer closes at the end of October. (6)
- A new website for Edinburgh residents to share ideas about fighting climate change in the city has been launched. The site, called Edinburgh Talks Climate, is part of a wider £57,500 council engagement plan to encourage conversation around the action needed to tackle climate change as Edinburgh emerges from lockdown and works towards its net zero carbon by 2030 ambition. (7)
- The Edinburgh Climate Commission has published a report entitles 'Forward, Faster, Together: Recommendations for a Green Economic Recovery in Edinburgh'. The Edinburgh Climate Commission is an independent body working to accelerate action on climate change in Edinburgh. A green recovery is one that delivers for the long term; that catalyses job creation into growth industries, empowers citizens, improves public health and drives innovation while all the time removing our contribution to the climate crisis. Earlier the Commission published a set of five principles designed to underpin the recovery and accelerate the transition: (1) Go Faster: Accelerate the transition to net zero; lock in carbon reductions and low carbon behaviours; lockout a rollback to business-as-usual; (2) Do Better: Measure what matters; judge success against more than economic indicators; include biodiversity, well-being and carbon reductions; (3) Build Stronger: Unleash the potential of local communities and producers; showcase innovation and positive adaptation; empower everyone to play their part in building a city resilient to future crises; (4) Think Bigger: Covid-19 has broken the belief that big change can't be done. The scale of our ambition; the breadth of our imagination; our commitment to collaborate and our willingness to embrace change must match the challenge of achieving net-zero carbon emissions; (5) Be Bolder: Use our voice as the capital of Scotland, to set the pace for action ahead of COP26; recognise the moral limits of markets and lead the debate on delivering a sustainable future. (8)
- Scottish and Southern Electricity Networks (SSEN) has partnered Dundee City Council for its Regional Energy System Optimisation Planning (RESOP) project. The project will develop a whole system planning tool to help support Dundee's net zero target of 2045 and its green economic recovery. The tool will be able to incorporate objectives and drivers for local authorities and businesses aiming to protect jobs and rebuild economic growth, with the ability to then assess the impact of these plans on the local electricity network. It will also be able to model the likely outcomes of future scenarios to help inform local decision making. The RESOP project received £343,000 in Network Innovation Funding in January, and the tool will be "instrumental in giving local communities a greater say in their energy future and helping to accelerate the decarbonisation of heat and transport" according to SSEN.

- Brighton and Hove City Council is planning to install solar panels on up to 1,000 council houses between 2020 and 2023. The first 500 are guaranteed, with the remaining 500 to be commissioned subject to grid and contractor capacity. (10)

1. Scottish Communities Climate Action Network 23rd July 2020 https://www.youtube.com/watch?v=20nRLl0-qBw&feature=youtu.be
2. Times 1st Sept 2020 https://www.thetimes.co.uk/edition/business/councils-tap-small-investors-to-fund-local-green-projects-lhmf8fslg
3. Business Green 25th Aug 2020 https://www.businessgreen.com/news/4019317/council-issued-green-bond-enables-residents-invest-solar-farm
4. Solar Power Portal 20th Aug 2020 https://www.solarpowerportal.co.uk/news/warrington_borough_council_launches_green_investment_scheme_for_solar_farm
5. Herald 20th Aug 2020 https://www.heraldscotland.com/news/18664845.solar-panels-installed-stirling-low-carbon-travel-hub/
6. https://www.edinburghsolar.coop/wp-content/uploads/2020/09/Edinburgh-Community-Solar-Share-Offer-final-2809.pdf
7. Edinburgh Evening News 23rd July 2020 https://www.edinburghnews.scotsman.com/news/environment/new-website-where-edinburgh-residents-can-share-ideas-about-fighting-climate-change-city-will-launch-next-monday-2922681?s=09 and https://edinburghtalksclimate.dialogue-app.com/
8. Edinburgh Climate Commission 9th July 2020 https://www.edinburghclimate.org.uk/sites/default/files/ECC_Report_ForwardFasterTogether.pdf
9. Current 28th July 2020 https://www.current-news.co.uk/news/ssen-partners-dundee-city-council-for-whole-system-planning-tool
10. Solar Power Portal 10th June 2020 https://www.solarpowerportal.co.uk/news/up_to_1000_homes_to_receive_solar_pv_in_new_brighton_hove_city_council_sche

10 Hydrogen

The debate about hydrogen vs heat pumps & district heating continues. Dave Toke says politicians are being hoodwinked by the gas industry to back blue hydrogen – made from natural gas using carbon capture and storage - for domestic heating. The industry has scored a success in persuading the House of Commons Environmental Audit Committee to back its plans. But this spells disaster. For a start only a maximum of 85% of the carbon is likely to be captured. Even if the hydrogen came from renewable energy this would still be a colossal waste of renewable energy resources. (1)

Jan Rosenow of the Regulatory Assistance Project agrees with Toke. He says hydrogen has an important role to play in the clean energy transition, but there are better options for decarbonising heating in our homes. Hydrogen may seem like an attractive narrative for policymakers for several reasons, not least because it suggests the possibility of a low-cost transition to net zero that consumers will barely notice – unlike energy efficiency upgrades, installation of heat pumps and heat networks using renewable heat and other low-carbon sources.

Using hydrogen for heating our buildings at scale is problematic for various reasons:

Producing "green hydrogen" from electrolysis is extremely wasteful compared with using renewable power directly to run heat pumps or electric vehicles. It takes about five times more wind or solar electricity to heat a home with hydrogen than it takes to heat the same home with an efficient heat pump. As a result of this inefficiency, the required build rates for renewables would be extremely challenging;

- Green hydrogen is not cheap - significantly more than current residential gas prices;
- Blue hydrogen is a mirage. Converting fossil gas to hydrogen requires carbon capture and storage (CCS) to permanently store the resulting greenhouse gas emissions, and there would still be carbon emissions of 15–40%, part of which are upstream emissions in regions where gas is extracted.
- converting a gas grid to a hydrogen grid is not as simple as just putting a new gas in the pipes network. Hydrogen is a different gas with different properties. It can corrode older pipes and leaks more in newer pipes.
- It would also require existing gas meters and the burner tips in home appliances, and sometimes the whole appliance, to be replaced. This is a huge task.

Even if hydrogen becomes available in large quantities and at lower costs than expected, it will not play a large role in decarbonising heating systems any time soon. Centrica, the world's oldest and Britain's largest gas utility, recently said "*domestic hydrogen use is likely more than ten years away, with the costs to customers as yet unknown*". (2)

Whether or not we expect to use hydrogen for domestic heating in future, we need to get on with making homes more efficient and converting to low carbon heating. At current rates, it will take 700 years for the UK to move to low-carbon heating, and at least 19,000 homes a week must be upgraded between now and 2050. There was a record rise last year of 1.8% in the number of new gas boilers installed, showing that the UK is going in the wrong direction. Government plans will see only about 12,500 homes in total installed with low-carbon heat pumps, according to a report from the UK Energy Research Centre (UKERC). (3)

It would take an onshore wind farm covering 18,000 sq km to produce enough electricity to create green hydrogen to power all the UK's long distance lorries, whereas it should be possible to power them with electricity from wind farms on 5,300 sq km. Richard Lowes, a research fellow at Exeter University's energy policy group, said he was "*deeply concerned*" that the government might commit to an unproven technology. He said he feared the push for hydrogen was "*just a delaying tactic by the gas industry*". (4)

Meanwhile, Leeds Trades Union Council has issued a call for large-scale investment to insulate homes and install electric heat pumps as an alternative to the multi-billion-pound Northern Gas Networks' H21 hydrogen project, which could tie up billions of pounds of government money in risky carbon capture and storage technology, which is not proven to work at the scale required. "*Continuing to extract and burn carbon-based fuels in any form – with or without carbon capture – is not compatible with preventing dangerous global heating*." Leeds TUC says this is a choice between two paths of technological development. One guarantees new demand for natural gas, and relies on an expensive, uncertain technofix. The other guarantees near-term reductions in energy use and warmer homes, and forms part of the transition to a 100% renewables electricity system. (5)

The energy white paper is likely to contain measures to encourage the development of hydrogen as a replacement for gas-fired boilers alongside heat pumps. (6) And "Green hydrogen" could eventually become the cheapest form of hydrogen leapfrogging hydrogen made with gas and coal before the end of the decade. (7)

Scottish Power's Green Hydrogen for Scotland project is bringing together leading names in renewables to provide hydrogen fuel for buses, ferries, lorries and even trains. The project will see Glasgow introduce fleets of hydrogen-powered buses as part of its ambition to use 100 per cent green energy to fuel such vehicles by 2029. (8) Dubbed Green Hydrogen for Scotland, the partnership aims to develop a market proposition for green hydrogen as a zero-emission fuel for heavy transport such as trucks, buses, ships and trains, with plans to develop a raft of production facilities and refuelling stations for the gas north of the border. The first plant will be built on the outskirts of Glasgow near Whitelee wind farm with hopes of it being in operation within 2 years. (9)

Aberdeen's new bus fleet has now driven one million miles and transported one million passengers. Its fuel cell fleet has doubled from ten to 20 buses and it is projected to grow to 50 vehicles. BP has signed a deal with council leaders in Aberdeen as part of efforts to cut emissions and help it become a "climate-positive city". (10)

But some question whether hydrogen should be used for buses. Electrolysis combined with a hydrogen fuel cell is about half as power efficient as a battery, so hydrogen will cost twice as much for each km travelled, so hydrogen buses would require a wind farm double the size of that required for electric buses. (11)

1. 100% Renewables 7th Aug 2020 https://100percentrenewableuk.org/alarm-politicians-are-being-hoodwinked-by-gas-industry-to-back-hydrogen-for-domestic-heating
2. Energy Monitor 29th Sept 2020 https://energymonitor.ai/sector/heating-cooling/heating-homes-with-hydrogen-are-we-being-sold-a-pup
3. UKERC (accessed) 8th Oct 2020 https://ukerc.ac.uk/publications/net-zero-heating/?s=09
4. Times 24th Sept 2020 https://www.thetimes.co.uk/edition/news/fossil-fuel-companies-misleading-prime-minister-on-green-hydrogen-j7v6wnn6q
5. People & Nature 2nd Sept 2020 https://peopleandnature.wordpress.com/2020/09/02/leeds-trades-unionists-zero-carbon-homes-can-help-tackle-climate-change/

6. Telegraph 3rd Oct 2020 https://www.telegraph.co.uk/business/2020/10/03/alok-sharma-can-put-britain-course-reach-net-zero-emissions/
7. Guardian 2nd Oct 2020 https://www.theguardian.com/environment/2020/oct/03/green-hydrogen-from-renewables-could-become-cheapest-transformative-fuel-within-a-decade
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10. Herald 8th Sept 2020 https://www.heraldscotland.com/news/18703646.bp-signs-pledge-make-aberdeen-climate-positive/
11. Energy Voice 16th Sept 2020 https://www.energyvoice.com/opinion/265609/over-selling-hydrogen-in-aberdeen/

11 Offshore Wind Jobs

The row over offshore wind jobs has rumbled on after SSE announced that all of the turbine jackets for its Seagreen project, located off the coast of Fife will be fabricated in China or UAE. The Scottish Government campaigned for BiFab to win the work, but operator SSE Renewables said the gap between BiFab's submission and the foreign rivals was "too significant to close". (1)

George Kerevan, former SNP MP for East Lothin says we didn't learn our lesson from oil. "*Imagine a tiny country that discovers great natural energy resources on its doorstep. Imagine there is a huge, pent-up global demand for these resources. Fortunately, it is a country of brilliant engineering ingenuity as well as being rich in capital*". Scotland was promised a renewables jobs and income bonanza just as it was promised an oil jobs and income bonanza. Instead, we have suffered a double whammy unprecedented in the history of small nations cursed with natural wealth – we have been robbed twice over. What went wrong?

"*We are all being screwed so companies can hike their profits and buy cheap foreign engineering kit. This begs an obvious question: how can you build big bits of generating kit on the other side of the globe, then transport it to Fife, and still undercut Scottish suppliers?*"

Why not make power companies subsidised by the public through the CfD put something back in by hiring Scottish engineering companies? Other countries do this. Besides, the Chinese are subsidising their offshore platform constructors, so BiFab is facing a rigged market. (2)

(1) Dundee Courier 19th Sept 2020 https://www.thecourier.co.uk/fp/business/business-news/1590424/anger-as-fifes-bifab-overlooked-for-work-on-neighbouring-wind-farm-in-favour-of-chinese-company/
(2) The National 21st Sep 2020 https://www.thenational.scot/news/18734810.didnt-learn-lesson-oil-now-scotland-paying-price/

12 Floating Wind

A group of international businesses is forming a consortium to bid for acreage to develop floating wind farms in Scottish waters. Baywa, of Germany, Elicio, from Belgium, and Ideol, a French company, are working on a joint bid to apply for sites in a leasing round launched recently by Crown Estate Scotland. It is estimated that up to ten gigawatts of capacity could be developed over the next decade, bringing in billions of pounds in investment. (1)

The Carbon Trust estimates that around 70GW of floating wind could be installed across the globe by 2040. The nascent sector could expand rapidly to deliver £195bn worth of projects, underscoring the "*opportunity for the supply chain globally to support and invest in floating wind*". Even in the shorter term, the study predicts the sector delivering up to 10.7GW of global floating wind capacity by 2030. (2) Most of this growth will be in Asia (31.8GW), with Europe a close second (28.2GW), and the remainder in US waters (9.8GW). There is currently just 73MW of operational floating offshore wind capacity, according to the Carbon Trust, with 124MW due online by the end of the year. (3)

But jobs in floating wind are heading in the same direction as other offshore wind jobs. According to the developer behind the Kincardine Offshore Floating Wind Farm, firms are being forced to give work to overseas companies because Scottish yards don't yet have the capacity to cope with major offshore wind developments. Last week, three of the five floating foundations for the Kincardine project set sail from Ferrol in Spain, where they were built by Cobra Wind, destined for Rotterdam. The turbines will then be mounted in the Dutch port before they're towed to location around 15 kilometres offshore between Stonehaven and Aberdeen. (4)

The UK has a chance to become a global leader in floating wind, but we need to see develop a much more strategic industrial approach, to making sure that we secure and we develop the floating wind sector within the UK. (5)

1. Times 23rd July 2020 https://www.thetimes.co.uk/edition/scotland/europeans-float-idea-of-scottish-offshore-wind-farm-development-9075b79p0
2. Business Green 15th July 2020 https://www.businessgreen.com/news/4017797/floating-wind-set-sail-70gw-capacity-2040-study-predicts
3. Wind Power Monthly 14th July 2020 https://www.windpowermonthly.com/article/1689437/floating-wind-accelerate-70gw-2040
4. Energy Voice 28th Sept 2020 https://www.energyvoice.com/otherenergy/267685/renewables-supply-chain-scotland-investment/
5. Herald 8th Oct 2020 https://www.heraldscotland.com/business_hq/18778746.floating-windfarms-fuel-north-sea-supply-chain-recovery/

13 Island Energy

Energy regulator Ofgem has approved a huge power link cable from the Shetland Isles to the Scottish mainland. The decision is “crucial” to the future of energy developer SSE Renewables’ plans to build the 103-turbine Viking Onshore Wind Farm on Shetland. A proposal tabled by SSE subsidiary Scottish and Southern Electricity Networks (SSEN) to build a 600 megawatt (MW) subsea electricity transmission link was rejected last year. (1)

1. Shetland Times 16th July 2020 https://www.shetlandtimes.co.uk/2020/07/16/ofgem-approves-interconnector-cable-plans

14 Wave Power

Fife fabrication firm AJS Production is working on a 30-tonne wave machine which will take to the seas this year. The Cowdenbeath steelwork specialist is forging ahead with the fabrication of the 20-metre long Blue Star wave energy converter, designed by Edinburgh start-up Mocean Energy. The half-scale device will be deployed at the European Marine Energy Centre (EMEC) in Orkney for sea trials prior to generating first power next year. The programme is supported by £3.3 million from Wave Energy Scotland through their Novel Wave Energy Converter programme.

1. Energy Voice 22nd June 2020 https://www.energyvoice.com/otherenergy/247094/new-wave-of-work-for-fife-fabricator-ajs/ and Dundee Courier 22nd June 2020 https://www.thecourier.co.uk/fp/business/business-news/1387106/new-wave-of-work-for-fife-fabrication-firm/

15 Balancing Renewables

Edinburgh-based demand response specialist, Flexitricity, can now provide flexibility services to the National Grid worth over 500MW. Flexitricity’s virtual power plant (VPP) aggregates flexibility from a wide range of assets owned by customers across Britain, including hospitals, universities, local authorities, district heating schemes, supermarkets, and commercial growers, the company said. (1)

Meanwhile, manufacturing work has started on key equipment for a project to showcase how old mineshafts could be used as batteries to store renewable energy. Gravitricity is spending about £1 million building a demonstration rig of its technology and hopes to begin testing in the spring. The company believes that huge weights on cables attached to winches on the surface can help to balance out the intermittent nature of wind farms. On days when excess electricity is being generated, the weight is lifted to the top of a shaft. At times when demand is outstripping supply,

the weight can be quickly lowered, with the movement producing power. The company believes that eventually the cost of its proposition will be lower than the large-scale lithium ion battery deployment that is being considered by many renewable energy producers. The Edinburgh-based company said work on the demonstration facility, which will be installed in Leith, is progressing well. (2)

1. Business Green 22nd June 2020 https://www.businessgreen.com/news/4016765/flexitricity-hits-500mw-milestone-forecasts-dramatic-growth
2. Times 31st Aug 2020 https://www.thetimes.co.uk/edition/scotland/gravitricity-test-set-to-add-weight-to-energy-prospect-xf2hj5dkc